

A Report on Wild Life Surveys in South and West India

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BY

J. JUAN SPILLETT

(With four plates and two-maps)

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Wild Life Sanctuaries in Madras State ¹

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I. THE MUDUMALAI WILD LIFE SANCTUARY

INTRODUCTION

I arrived at the Abhayaranyam Forest Rest House in the Mudumalai Wild Life Sanctuary, from Bandipur, on the morning of November 30, 1966. Bandipur, in the Venu Gopal Wild Life Park in Mysore, is 10 miles from Abhayaranyam.

The 125-square-mile Mudumalai Wild Life Sanctuary in the north-western corner of the State is the largest and best known sanctuary in Madras. It is located in the Gudalur Division of the Nilgiri District and borders both the States of Mysore and Kerala (Map 1). The tri-state area including the Mudumalai Sanctuary, the adjoining Bandipur Sanctuary in the Venu Gopal Wild Life Park of Mysore, and a wild life area in Kerala, which has been proposed as a wild life sanctuary, comprises the most complete ecological unit dedicated to the preservation of wild life in India.

In 1940 a 23-square-mile sanctuary, adjoining an area in Mysore State which was constituted as the Bandipur Sanctuary in 1941, was established as the Mudumalai Wild Life Sanctuary—the first true wild life sanctuary in Madras State. The sanctuary was extended to 114 square miles in 1956 and an additional 11 square miles have since been included.

Mudumalai includes the Mudumalai and Segur ranges of the Nilgiri Division. A Range Officer from the State Wild Life Organization is assigned to each of these ranges. A third Range Officer is in charge of statistics and wild life studies within the sanctuary. Additional personnel assigned to the sanctuary from the State Wild Life Organization include: a clerk, three peons, ten Forest Guards, 18 Forest Watchers, a Watcher-cum-Cook and a sweeper. These men are charged with the responsibility of protecting the sanctuary's wild life, attending or assisting visitors, and maintaining the sanctuary's interior roads, salt licks, observation towers and other facilities. In addition to the sanctuary's wild life staff, regular Forest Department personnel, including two terri-

torial Range Officers, are in charge of all forest operations within the sanctuary. Mudumalai also is composed of several forest blocks. The centrally located Mudumalai and Teppakadu Blocks, the Benne Block on the western end of the sanctuary adjoining Kerala, and the Moyar Block on the eastern end adjoining Mysore are the main wild life areas.

The dense forests and luxuriant vegetation in most of Mudumalai contrast markedly with the dry deciduous forests of the adjoining Venu Gopal Wild Life Park. Much of Mudumalai receives between 50 and 80 inches of rainfall per year as compared to about 35 inches in Venu Gopal. The verdant vegetation of Mudumalai presents a more varied habitat for wild life than the open forests of Venu Gopal, but the thick undergrowth also makes wild life observation or photography much more difficult. The Moyar River, which forms the natural boundary between Madras and Mysore States, is the most important source of water in the sanctuary. There are a number of other streams, but most of these, such as the Kakkanahalla and Avarahalla, dry up during the summer.

VISITOR FACILITIES

Visitors to the Mudumalai Sanctuary are requested first to check with the Range Officer at the sanctuary's headquarters in Kargudi. Kargudi is along the main Ootacamund-Mysore road, 40 miles from Ooty and 60 miles from Mysore. The Mysore-Madras State border is five miles to the north-west and Bandipur, the headquarters for the Venu Gopal Wild Life Park, an additional five miles to the north (Map 2). Daily bus services between Ooty and Mysore pass through the sanctuary and upon request will stop at Kargudi or the nearby Abhayaranyam Forest Rest House. The nearest railway station is at Ooty and the nearest airport is at Coimbatore, 52 miles south-east of Ooty.

There are 45 miles of fair-weather roads within the sanctuary, along which motoring may be done except during the rainy season. The Forest Department provides a truck to take visitors around the sanctuary. An 18 passenger bus also was purchased in 1966 for visitor use, but a number of the sanctuary's roads must be widened before it may be used on them. Six machans or observation towers have been built at salient points overlooking salt licks and water holes. Visitors may remain in these and observe wild life in relative comfort. However, the best manner in which to view wild life in Mudumalai is from elephant back. Riding elephants from the elephant camp about one and one-half miles east of Abhayaranyam are provided for visitors upon prior request. With care, visitors on elephant back may approach near to herds of gaur and other wild animals without disturbing them.

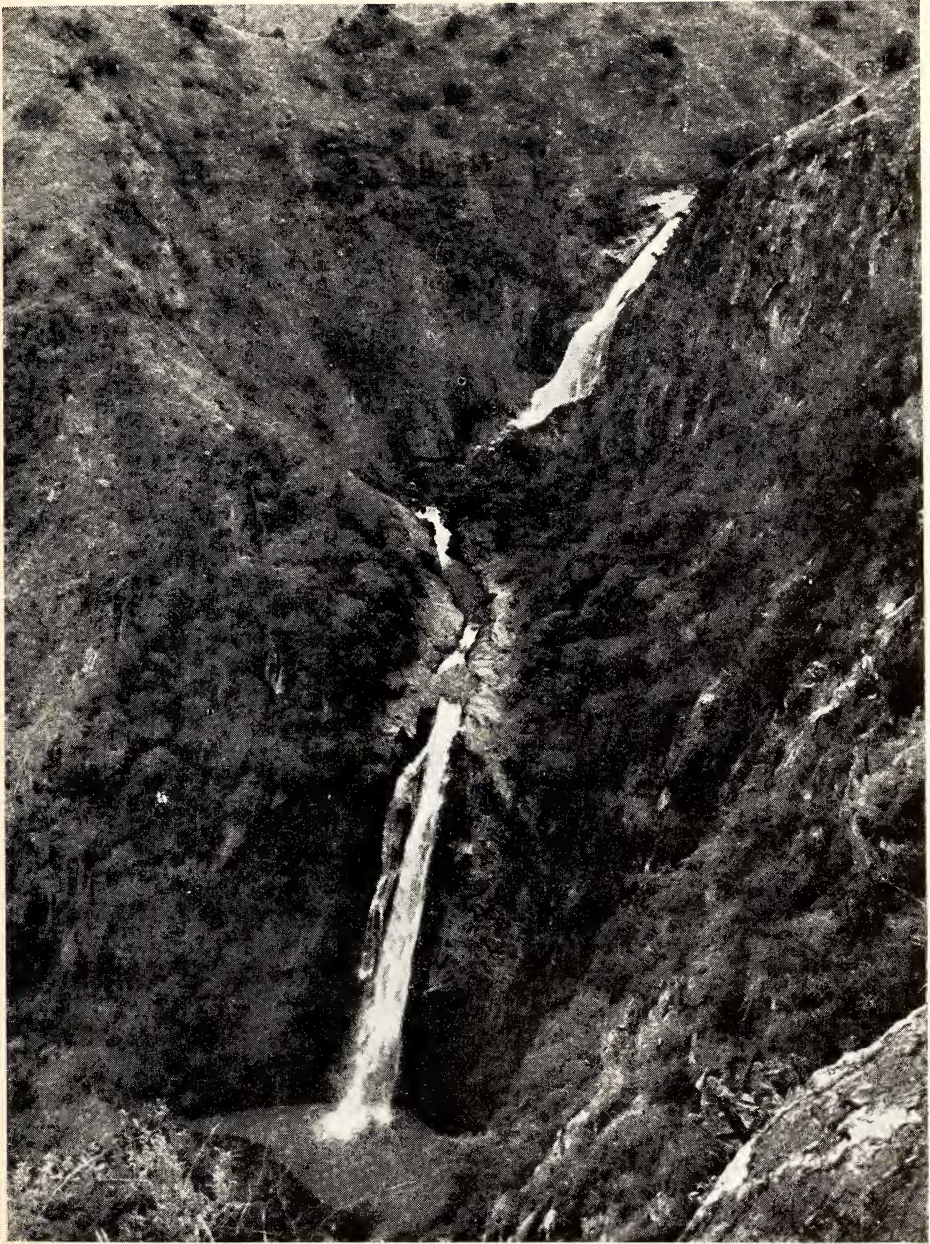
There are three Forest Rest Houses in Mudumalai : Abhayaranyam, Kargudi and Masinigudi. All provide modern amenities, including refrigerators and catering. A cook is attached to each and both vegetarian and non-vegetarian meals are served. However, for prolonged visits it is suggested that visitors bring their own provisions. Reservations for accommodation and food, as well as elephant rides or transportation within the sanctuary, may be made through either the Divisional Forest Officer in Ootacamund or the State Wild Life Officer, c/o Chief Conservator of Forests, Central Office Buildings, 81 Mount Road, Madras-6.

The Abhayaranyam Forest Rest House is located along the main Ootacamund-Mysore road about one-half a mile west of the sanctuary headquarters at Kargudi. It is the most modern of the sanctuary's rest houses and even has a darkroom for the use of camera enthusiasts. Two double suites are provided which will accommodate a total of five people. The present cook and caretaker is exceptional and the food and services excellent. The Kargudi Forest Rest House is situated on the crest of a hill a little over one-half a mile north of the sanctuary headquarters. It has a beautiful sylvan setting and provides a good view of much of the sanctuary. Two large double suites, which may accommodate up to three persons each, and an extra bedroom are provided here. It belongs to forest operators of the Forest Department rather than to the wild life organization as does Abhayaranyam. The Masinigudi Forest Rest House is located on the eastern end of the sanctuary. This rest house has three suites. Although it is well-maintained, it is located near a fairly large village and does not provide the atmosphere of the Kargudi or Abhayaranyam rest houses.

Plans have been submitted and accepted by the State Wild Life Organization for the construction of a ten-room dormitory, and the estimated cost is Rs. 50,000. Construction is to be completed in 1968.

The proposed rest house is much needed for the ever-increasing numbers of visitors to the Mudumalai Sanctuary. With their completion and the availability of accommodation for large groups or regularly scheduled tours, the number of visitors should increase even more rapidly. A total of only 640 visitors were recorded for Mudumalai in 1960. However, by 1965 the number was almost 4000, an increase of well over 600 per cent. Likewise, only 18 foreign visitors were recorded in 1960, but a total of almost 600 in 1964. The total number of visitors to the sanctuary between 1960 and June 1966, as reported by the Forest Department, was 17,656 including 1578 foreign visitors. When transportation and other expenses incurred in travelling are considered, to and from the sanctuary as well as expenditures for food and other facilities within the sanctuary, the revenue realized by the State and Nation from the Mudumalai Sanctuary is considerable. Conservatively estimated, the

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Segur River Falls near the western boundary of the Mudumalai Wild Life Sanctuary.

(Photo : J. J. Spillett)

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Above : Chital near the Abhayaranyam Forest Rest House, Mudumalai Wild Life Sanctuary.

(Photo : J. J. Spillett)

Below : The Gaur or Indian "Bison", a common inhabitant of the Mudumalai Sanctuary.

(Photo : M. A. Badshah)

current revenue from Mudumalai's wild life probably exceeds Rs. 4 lakhs per annum. Further, this is realized with very little capital investment and represents only a small portion of the sanctuary's potential as a revenue earner.

HABITAT

The Mudumalai Sanctuary consists primarily of undulating forest-covered hills nestled at the base of the Nilgiri Hills. The Nilgiris attain a height of 8000 feet and form the skyline to the south and west of the sanctuary. The altitude of the Mudumalai Sanctuary varies between 3000 and 3800 feet (914-1158 m.) above sea-level.

The overall average annual rainfall is approximately 56 inches (1422 mm.), although rainfall varies greatly in different parts of the sanctuary. For example, much of the Benne Block receives about 80 inches of rainfall per year, most of which falls during the south-west monsoon between June and September. Kargudi, on the south-eastern side of the Mudumalai Block, receives an average of about 50 inches per annum. The Moyar Reserve, however, receives only about 35 inches per year. And, most of the rainfall in the eastern part of the sanctuary falls during the north-east monsoon between October and December. Therefore, as would be expected, the vegetation likewise varies greatly in different parts of Mudumalai.

December and January are the coldest months. Monthly minimum and maximum mean temperatures for these months are respectively 55° F. (12·8° C.) and 70° F. (21·1° C.). The hottest months are April, May, and June, prior to the onset of the south-west monsoon rains. Monthly maximum and minimum mean temperatures for these months are respectively 90° F. (32·2° C.) and 75° F. (23·9° C.).

February, March and April are the driest months, although the dry season for most of the sanctuary extends from October until late June. The sanctuary staff burn the dry grass and undergrowth each year between December and January, along block lines, fire lines, State boundary, and around residential buildings. This improves visibility and permits the growth of succulent vegetation. Therefore, the best time to observe wild animals in Mudumalai is between mid-February and late June. In contrast, the best time to observe wild animals in the adjoining Venu Gopal Park is between June and October, during the rainy season. The vegetation in Mudumalai, however, is greener and presents a more tropical luxuriance in October and November. This is pleasing to the eye, but also it is discouraging not to be able to observe the wild animals.

The entire sanctuary is exploited for forest produce. There are a number of teak plantations, primarily in the Benne Block, and a plan-

tation of *Eucalyptus* in the Masinigudi area in the eastern part of the sanctuary. The planting of bamboo for the rayon mills in Kerala also has gained prominence during the past five years. Bamboo shoots are planted at 39-foot intervals and the plantings have a three-year rotation period. Such plantings probably are beneficial for gaur and elephant, as well as other wild animals that feed extensively upon bamboo.

The major part of the sanctuary still consists of more-or-less natural forests. All, however, are worked intensively for forest produce. Timber extraction includes both clear felling and selective cutting. Exploitation of minor forest produce is likewise of importance in the sanctuary. This includes the collection of wild honey, antlers, *poochakottai* or soap nut (*Sapindus emarginata*), a type of moss used as a food condiment, gallnut for medicinal use from *Terminalia chebula* and *T. belerica*, and edible fruits from such trees as the tamarind (*Tamarindus indica*). Kurumbars, tribal hill people, collect most of the minor forest produce through the Co-operative Department and under lease from the Forest Department. Kurumbars also comprise most of the labour force employed by the Forest Department at Mudumalai. With the exception of the Moyar Block at the eastern end, domestic livestock grazing inside the sanctuary consists of about 200 animals belonging to employees, such as the Kurumbars.

Flora

The flora of Mudumalai is noticeably varied in different parts of the sanctuary. Generally speaking, the forests vary from dry deciduous scrub on the eastern end to dry deciduous and then moist deciduous with more and more intermingled evergreen species as one progresses further west. There are also a fair number of swampy areas in the northern part of the sanctuary.

The tree growth in the Masinigudi area on the eastern end is stunted, with thorny undergrowth and short grass. Species of *Acacia* and *Albizzia* predominate in this section. The scrublands merge into relatively open dry deciduous forests with somewhat stunted trees of such species as *Shorea talura* and *Anogeissus latifolia* as well as species of *Acacia* and *Albizzia*.

The forests of the Mudumalai Block also are deciduous. However, they grade from dry deciduous into primarily moist deciduous forests. Here the trees attain impressive heights and the undergrowth is much more dense. Ferns, vines and rank grasses are common. Characteristic tree species include: *Terminalia tomentosa*, *T. belerica*, *T. chebula*, *Anogeissus latifolia*, *Schleichera oleosa*, *Gmelina arborea*, *Lagerstroemia lanceolata*, *Pterocarpus marsupium* and so forth. Dwarf date palms (*Phoenix acaulis*) predominate in some forest belts and in the vicinity of the swampy areas near the Madras-Kerala border.

The Benne Block consists of an admixture of evergreen and moist deciduous forests. Big Bamboo (*Bambusa arundinacea*) is common throughout the sanctuary wherever there is sufficient moisture. According to M. Krishnan, the bamboo flowered gregariously in 1959 in the Benne Block. Some of the bamboo along the Madras-Mysore boundary also flowered in 1964, as did most of the big and small bamboo in the adjoining Venu Gopal Wild Life Park. However, most of the bamboo inside the sanctuary appears to have completely regenerated and gives many of the forests a luxuriant light-green appearance.

Roughly two-thirds of the forests of the Mudumalai Sanctuary are moist deciduous. The other one-third is primarily dry deciduous. An overall estimate of the per cent composition of the dominant species in the moist deciduous forests of the sanctuary is given in Table 1.

The flowering of many of the forest trees in Mudumalai takes place about March.

TABLE 1

DOMINANT PLANT SPECIES OF THE MOIST DECIDUOUS FORESTS OF THE MUDUMALAI WILD LIFE SANCTUARY IN MADRAS STATE

English	Tamil	Scientific	Estimated per cent of Stand
<i>TREES OR CANOPY:</i>			
Teak	Thekku	<i>Tectona grandis</i>	20
Laurel	Mathi (Kanarese), Karimarudu	<i>Terminalia tomentosa</i>	10-15
Axlewood	Namai	<i>Anogeissus latifolia</i>	15
Rosewood	Eetti	<i>Dalbergia latifolia</i>	10
Ven-teak	Venthekku	<i>Lagerstroemia lanceolata</i>	10
	Vendai	<i>Kydia calycina</i>	5
Other Tree Species	—	—	10
Big Bamboo	Perumoongil	<i>Bambusa arundinacea</i>	15
<i>SHRUBS:</i>			
Lantana	Oonichedi	<i>Lantana camara</i>	very common
Indian Laburnum	Konnai	<i>Cassia fistula</i>	common

Fauna

The fauna of the Mudumalai Wild Life Sanctuary is both varied and abundant. Perhaps nowhere else in India may greater numbers of chital or spotted deer (Plate II) be observed than in the Masinigudi area on the eastern end of the sanctuary. Visitors may observe as many as 2000 deer while motoring along the roads of this area during the morning or evening. As a rule the animals are in groups of more than 30, and herds of over 100 are not unusual, except during the dry season (January-June) when they are scattered in small groups. One of the Range Officers stated that on several occasions he has observed that the much maligned Indian wild dog or dhole is afraid of large groups of chital, as well as of

man. They only attack small groups or solitary animals. Further, he claims he twice observed chital being pursued by wild dogs which came close to and stood by humans until the wild dogs had gone.

Mudumalai is also noted for its abundance of gaur or Indian 'bison'. This impressive beast is the largest and undoubtedly one of the most stately of the world's wild bovines or oxen (Plate II). It generally is associated with the sanctuary's moist deciduous forests and the ease with which a herd can melt silently into the forest is amazing. Herds of over 50 gaur are not uncommon and herds numbering more than 80 have been reported. Wild elephants (Plate III) are generally encountered by visitors to the sanctuary. Herds of 30 or more are observed not infrequently, but smaller groups or solitary males are the general rule.

Diurnal mammals, such as the common langur, the bonnet macaque and the brightly coloured giant or Malabar squirrel, are common and seen by almost all visitors.

Other mammals which are relatively common in various parts of the sanctuary may or may not be observed. These include such animals as sambar, barking deer or muntjac, mouse deer or Indian chevrotain, wild boar, blacknaped hare and Indian porcupine. Although rarely seen during the day, the last two are commonly observed at night. The Nilgiri langur is not found in the sanctuary. However, while travelling between Mudumalai and Ootacamund in September 1965, I observed a troop in the forests above Gudalur, less than 15 miles west of Abhayaranyam. Although not uncommon in Mudumalai, visitors may be considered lucky if they observe large carnivores, such as tiger, leopard or panther, dhole or Indian wild dog and sloth bear. The latter is actually an omnivore and feeds primarily on insects, fruits, and so forth. However, some visitors have reported three of these four species during a one or two-day visit and others have observed all four during a more extended visit.

A species of 'flying' lizard (*Draco* sp.) is reported to be fairly common in some parts of the sanctuary, such as in the vicinity of Abhayaranyam. I searched for this reptile on several occasions, but was never lucky enough to observe it. Although called a 'flying' lizard, it is incapable of flight. It glides from tree to tree in the same manner as the 'flying' squirrels, which also are represented in Mudumalai.

Python, the largest of India's snakes, and monitor lizards (*Varanus* sp.) are seen occasionally in Mudumalai, but crocodile is observed very rarely along the Moyar River. The Indian rat snake, however, is common and frequently encountered along the sanctuary's roads. I observed one specimen, which was approximately eight feet long, just east of the Abhayaranyam Forest Rest House. 'Some Large Reptiles of Madras State' are described and illustrated in a Forest Department booklet of that name by M. A. Badshah, the State Wild Life Officer. Some of the

animals inhabiting the Mudumalai sanctuary, including some of the more common or impressive reptiles, are listed in Table 2.

Mudumalai is a paradise for the bird watcher. A detailed check-list of birds has been compiled by M. A. Badshah, and the check-list made available to visitors. A latest check-list is under print with photographs of some rare birds. February through June is the breeding season for most of the birds in Mudumalai and the best time for bird watching or hearing their songs, as well as for observing other wild animals in the sanctuary. A check-list for these also should be made available to visitors and their observations systematically recorded in the visitors' book.

TABLE 2

NAMES OF SOME OF THE ANIMALS INHABITING THE MUDUMALAI WILD LIFE SANCTUARY IN MADRAS STATE

English	Tamil	Scientific	Relative Abundance
Indian Elephant	Yanai	<i>Elephas maximus</i>	common
Gaur or Indian 'Bison'	Kattu erumai	<i>Bos gaurus</i>	common
Sambar	Kudoo marn	<i>Cervus unicolor</i>	frequent
Chital or spotted Deer	Pullu marn	<i>Axis axis</i>	common
Barking Deer or Indian Muntjac	Kart ardu	<i>Muntiacus muntjak</i>	infrequent
Four-horned Antelope or Chousingha	Nangu kombu marn	<i>Tetracerus quadricornis</i>	infrequent
Mouse Deer or Indian Chevrotain	Sarugoo marn	<i>Tragulus meminna</i>	frequent
Wild Boar	Punri	<i>Sus scrofa</i>	frequent
Blacknaped or Common Hare	Muyal	<i>Lepus nigricollis</i>	frequent
Indian Porcupine	Mullampunri	<i>Hystrix indica</i>	common
Giant or Malabar Squirrel	Anil	<i>Ratufa indica</i>	common
Small Travancore Flying Squirrel	Parakum anil	<i>Petinomys fuscocapillus</i>	frequent
Common or Grey Langur	Korangu	<i>Presbytis entellus</i>	common
Bonnet Macaque	Korangu	<i>Macaca radiata</i>	frequent
Indian Pangolin	Alangu	<i>Manis crassicaudata</i>	rare
Tiger	Puli	<i>Panthera tigris</i>	infrequent
Leopard or Panther	Chiruthai	<i>Panthera pardus</i>	infrequent
Jungle Cat	Kattu poonai	<i>Felis chaus</i>	_____
Leopard Cat	_____	<i>Felis bengalensis</i>	infrequent
Striped Hyena	Kaluthai puli	<i>Hyaena hyaena</i>	rare
Indian Wild Dog or Dhole	Chennai	<i>Cuon alpinus</i>	infrequent
Otter	Neer nai	<i>Lutra sp.</i>	rare
Jackal	Naree	<i>Canis aureus</i>	frequent
Indian Fox	Kulla naree	<i>Vulpes bengalensis</i>	_____
Little Civet	Punugu poonai	<i>Viverricula indica</i>	_____
Stripe-necked Mongoose	Keeree	<i>Herpestes viticollis</i>	_____
Sloth Bear	Karadee	<i>Melursus ursinus</i>	infrequent
Python	Malai Pambu	<i>Python molurus</i>	infrequent
Indian Rat Snake	Sarai Pambu	<i>Ptyas mucosus</i>	common
Monitor Lizard	Udumbu	<i>Varanus monitor</i>	rare
'Flying' Lizard	_____	<i>Draco dussumieri</i>	frequent
Marsh Crocodile or Muggar	Mudalai	<i>Crocodylus palustris</i>	rare

An unusual, but outstanding and oftentimes beautiful feature of Mudumalai is its abundant insect life. During some nights in April entire areas in the sanctuary are illuminated by the flashing luminescence of fire flies. Although these small creatures are present and noticeable during much of the year, only during particular seasons do they become so apparent. Not to be overlooked are the sanctuary's numerous species of intricately-coloured butterflies.

The spiders, which spin their giant webs between the trees, and the mounds of the termites also form a conspicuous part of the sanctuary. I was intrigued particularly by the colourful patterns of some of the spiders and spent the better part of one afternoon photographing these beautiful creatures. Many display intricate designs of bright yellow or reds on a black background and some attain relatively large sizes, spanning more than five inches across both the body and legs.

Good numbers of fair-sized fish inhabit the Moyar River below Kargudi. The tribal people working in the sanctuary were having exceptionally good luck one evening during my visit. Although I was not acquainted with the species which they caught, I watched them catch a number of fish weighing up to three pounds and they claimed that they were very good eating.

OTHER ATTRACTIONS

The exquisite flora and fauna are, of course, the outstanding attractions of the Mudumalai Wild Life Sanctuary. Nevertheless, there are a number of scenic or other attractions in or near the sanctuary, which I think deserve major consideration. The elephant camp near Teppakadu, which is on the eastern side of the river about a mile from Kargudi, is of special interest. It is claimed that more elephants have been born in captivity here than anywhere in India. About 20 elephants are stationed at the camp or at nearby camps in the sanctuary's forests. Most are used for timber work, although a few are made available for visitors to ride.

Some of the mahouts take pride in demonstrating the abilities of their charges. These highly intelligent beasts will bow, 'salaam', pick up delicate objects with their versatile trunks and appear in many cases to be able to do almost anything their mahouts ask of them. Many respond correctly to over 30 commands. These are given vocally, by leg and foot signals, or through prodding with a small stick. The mahouts are not allowed to use 'ankus' or force to make these huge animals do their bidding. A small calf or two usually may be found in the camp. Their inadroit movements and apparent uselessness of their trunks contrast notably with those of their parents.

East of the main Ootacamund-Mysore road near the Madras-Mysore

border in the Moyar Block is a loop road. This passes through relatively open forests. The Forest Department recently built a spur road from it to an observation point overlooking the falls and gorge of the Moyar River. The falls are estimated to be approximately 500 feet high. The deep rocky gorge and the surrounding forests, coupled with the cascading waters, present a truly magnificent spectacle.

An equally impressive sight is presented by the Segur River Falls (Plate I). The Segur River rises in the Nilgiri Hills to the south and flows along the eastern boundary of the sanctuary before tumbling an estimated 700 feet into the Moyar River Gorge. The Segur River and its two spectacular falls are located outside the sanctuary and at present may be reached by passing through the village of Hundiuyur and then following a jeepable cow path. An effort should be made to include the falls within the sanctuary. A suitable road leading to the observation point overlooking them also should be constructed. The nearby village of Hundiuyur, which has about 500 inhabitants, likewise should be relocated elsewhere so that the scenic grandeur of one of nature's finest displays may be preserved in its natural setting. This area presently is under the jurisdiction of the Revenue Department, which leases the land to the villagers for approximately Rs. 6 per acre per year. The rocky soil is unsuitable for agriculture and rightfully should be returned to forest.

The Nilgiri Hills to the south and east provide a magnificent setting for the Mudumalai Sanctuary. The steep slopes of this range, with the exception of frequent outcroppings of rock, are covered primarily with grass. They are frequently covered with mist and thin clouds trailing across their face add to their majesty. Particularly in the early morning, they are often cloaked in deep blues or purples—reminiscent of the colours used in many paintings of mountain scenery, but which are colours not commonly seen in natural settings. The winding journey up the steep slopes from Gudalur, 10 miles south-west of Kargudi, to the hill station of Ootacamund on the summit of the Nilgiris is an unforgettable experience. It may be uncomfortably warm at the beginning of the trip, but almost invariably one will be searching for a sweater or jacket while winding back and forth up the mountainsides, which are covered with tea plantations that appear like neatly trimmed hedges.

DISCUSSION

The timber resources of the Mudumalai Wild Life Sanctuary are under the jurisdiction of the Forest Department. The State Wild Life Officer is in charge of all the wild life sanctuaries in the State. It is realized that the forest products of Mudumalai provide a valuable source of revenue. However, the wild life in a wild life sanctuary should receive major consideration.

It is illogical at present to advocate the cessation of all forest operations within the sanctuary. But, on the other hand, whenever possible such operations should be planned and executed in the manner least detrimental or in a manner that will least disturb the sanctuary's wild life. For example, there is little justification for the establishment of a forest camp along the Kakkannahalla on one of the main migratory routes for wild life between Mudumalai and the Venu Gopal Wild Life Park in Mysore. This camp easily could have been located elsewhere where it would have interfered less with wild life movements. Extensive artificial plantings of trees, particularly exotic species such as *Eucalyptus*, should be discouraged within the sanctuary. Natural forests in this area are very productive and when properly managed probably will produce almost equal to plantation areas, if the additional expense and labour for the latter are taken into consideration. Extensive single species plantings often result in soil deterioration and a lower quality of timber, as well as form a biological desert as far as many species of wild animals are concerned.

The entire Mudumalai Sanctuary is subject to forest exploitation. The establishment of key areas solely for wild life, which are maintained inviolate to the depredations of man, has proven successful in a number of Indian wild life sanctuaries. The Bandipur Sanctuary or 'sanctum sanctorum' of the adjoining Venu Gopal Wild Life Park is a notable example. At least a token area, perhaps 10-square-miles, also should be set apart in Mudumalai as a true refuge for wild life. And, such an area should be maintained in as natural a state as possible.

A basic essential in the development and proper management of a wild life sanctuary is a good staff. Regretfully I have found relatively few such men in the sanctuaries that I have visited in India. More often than not those administering wild life areas have not been able even to identify many of the animals under their jurisdiction, let alone give factual information concerning their natural history.

Forest Department personnel should be encouraged to learn about wild life. Those who demonstrate a genuine interest in wild life should be given further opportunities to develop these interests. Wild life management is a technical profession and proper training, as well as interest and dedication, is needed by those entering this field. Openings for personnel qualified to manage wild life resources should be made available in the Forest Department and specifically in the State Wild Life Organization. Such positions also should be given the status they deserve and personnel who prepare themselves for such occupations should be sufficiently reimbursed.

There are at least 11 villages within the Mudumalai Sanctuary : six in the Masinigudi area and five in the Mudumalai Block. The estimated inhabitants for these villages total approximately 10,000 people, of which

about 4000 live in the village of Masinigudi. Large numbers of people near or within the confines of a sanctuary are not compatible to the preservation of wild life. Although villagers may be law-abiding, their presence in large numbers almost invariably results, either directly or indirectly, to the detriment of wild life. These detrimental effects often take the form of habitat destruction through agricultural use of the land or overgrazing by domestic livestock.

There are over 500 acres of land devoted to agriculture and over 2000 head of livestock grazed for very nominal fees in the Masinigudi area of the sanctuary. Grazing fees are : adult cows, Re. 0.50/year ; adult buffalo, Re. 1.00/year and sheep, Re. 0.25/year. Goats are prohibited. Large numbers of both domestic livestock and wild ungulates, particularly chital, in this area have resulted in severe overgrazing. Measures should be undertaken to reduce the numbers of both classes of grazing animals and then to maintain their numbers in balance with the grazing capacity of the area.

The rest of the sanctuary is relatively little disturbed by agricultural practices or by domestic livestock grazing. Hopefully it will remain this way. However, approximately 500 head of cattle per week pass through the sanctuary travelling from Mysore to Kerala for slaughter. These cause a disturbance, although measures have been taken to insure that they remain on the main roads and do not enter the sanctuary's forests. The Forest Department also requires that all the animals be inoculated to help prevent the spread of disease.

Poaching is not considered by the Forest Department to be a major problem in Mudumalai. However, with nearby areas open to shooting, both to the east and to the west, and with the number of vehicles that ply the roads through the sanctuary at night, it appears that poaching may be more of a problem than is realized. This was further suggested during my visits to the Masinigudi area on the eastern end of the sanctuary. Among the chital of that area, I observed a sex ratio of from four to five adult females for every adult male, whereas in a sanctuary where the animals are protected a sex ratio closer to 1 : 1 would normally be expected. Admittedly it is a mere conjecture on my part that poaching may be a factor, but I think it does deserve further investigation.

Overall the facilities and services provided for visitors to Mudumalai are excellent. The Forest Department and particularly the State Wild Life Organization are to be commended. It is hoped that a few suggestions, however, may help to make the Mudumalai Sanctuary even more attractive for visitors. Because of the dense vegetation in many parts of Mudumalai the viewing of wild animals and their photography is difficult. Therefore, as previously suggested by Mr. E. P. Gee of the Indian Board for Wild Life, I think the creation of ' a few grassy areas or *maidans* of, say, 200 or 300 yards in width, in suitable areas accessible to

visitors, where wild life could be viewed in the open, as at Kanha in Madhya Pradesh ' should be considered.

I was informed both during my September 1965 and December 1966 visits to Mudumalai that the roads in the western part of the sanctuary were impassable. Therefore, I still have not had the opportunity of visiting much of the Benne Block or the northern part of the sanctuary. If at all possible, these roads should be maintained so that visitors are not restricted primarily to the main road or the roads in the somewhat atypical Masinigudi area. Nevertheless, as in the Venu Gopal Wild Life Park, it would be well to permit visitors on these roads only when accompanied by a member of the sanctuary staff.

Some excellent pamphlets concerning wild life are already made available to visitors by the Forest Department. It is further suggested that additional literature, namely, appropriate postcards, check-lists for mammals and birds, books on Indian birds and animals, etc., also be made available. These, as well as those presently distributed free of charge, could be sold at nominal prices in the forest rest houses or at the sanctuary headquarters in Kargudi. Standard books on mammals and birds are available in the rest houses for the use of visitors. Wild life picture postcards are under print.

A number of complaints concerning the inefficiency of the present system for making reservations in Mudumalai were noted in the visitors' book. I was also informed and personally witnessed in 1965 that visitors without reservations may be turned away from an almost empty Forest Rest House. This is because reservations are not made at the sanctuary, as they should be, but in Ootacamund. The first notice that the staff often has is when visitors arrive with their reservations. Thus, members of the staff do not dare provide accommodations for visitors without reservations for fear that those with reservations might arrive later and be upset by the inconvenience that may result. There are daily bus and mail services between Ootacamund and the sanctuary, as well as telephone service. Therefore, there is no reason why bookings for reservations cannot be made more efficiently at the sanctuary's headquarters and the D.F.O. in Ooty then notified, instead of the other way around.

Other suggestions have been made in the main text of the Mudumalai section of this report. Some of the general suggestions given for the Vedanthangal Water-Bird Sanctuary (P. 653) also apply equally well to Mudumalai.

II. THE VEDANTHANGAL WATER-BIRD SANCTUARY

INTRODUCTION

Nesting colonies of water-birds near villages in south India have been protected by villagers since ancient times. Thus the preservation of such colonies has become a part of the traditional culture of many of the rural

people in this part of India. The nesting colony of water-birds near the village of Vedanthangal in the north-western part of the Maduranthakam Taluk of Chingleput District in Madras State is perhaps the most spectacular of these colonies. It is perhaps also the oldest bird sanctuary in south India. Although only officially recognized and maintained by the Government as a sanctuary since 1936, Vedanthangal has been essentially a sanctuary for water-birds for more than a century and a half. Documentary evidence clearly indicates that the villagers of Vedanthangal have actively safeguarded the colony at least since 1790.

The Vedanthangal Sanctuary is a prime example of wild life conservation by the local people through their understanding of some of the true values of wild life. It further demonstrates that an enlightened public will take the measures necessary to preserve and protect the natural resources under their jurisdiction—if they but understand some of the benefits to be derived by so doing.

HABITAT

Vedanthangal is 400 feet (122 metres) above sea-level and less than 30 miles inland from the Bay of Bengal. Rainfall averages approximately 45 inches (1143 mm.) per annum, most of which falls during the north-east monsoon between September and December. The south-west monsoon is only of minor importance. The hottest months are April to June, when maximum temperatures often exceed 100° F. (37·8° C.). The coolest months are December and January, when the minimum and maximum average monthly temperatures are respectively 65° F. (18·3° C.) and 80-85° F. (26·7-29·4° C.).

The countryside surrounding Vedanthangal is flat, comprised primarily of rocky plains interspersed with scattered bushes and trees. There are frequent low-ridged hillocks and tanks or small lakes dotting the landscape. The latter are used for irrigation, although these low-lying areas are subject to extensive flooding during the heavy rains of the north-east monsoon.

The combination of agricultural lands and seasonal inundation in this region generally provides a plentiful supply of food for the water-birds of Vedanthangal. This undoubtedly is one of the primary reasons why such large numbers of birds gather here during the breeding season. Another important factor is that the approximately 74-acre Vedanthangal Tank, which comprises the sanctuary, is the only one in this region that provides a compact grove of trees suitable for nesting. This grove, which is more or less centrally located in the Vedanthangal Tank, consists of about 500 *Barringtonia acutangula* trees. This species withstands seasonal water-logging quite well. The trees form a compact grove with an almost contiguous canopy 15 to 20 feet high, which occu-

pies approximately half of the area of the tank and offers a suitable nesting site for water-birds.

The Forest Department has been attempting to augment the number of trees in the grove inside the tank. One thousand *Barringtonia* seedlings were planted in 1966. The tank is dry approximately four months each year. However, with the arrival of the monsoon some of the seedlings were soon inundated and eventually died.

A bund or dam along the western side of the sanctuary impounds the water of the tank. A path bordered by trees and bushes runs along the top of the bund. The dominant tree species here are : Siris (*Albizia lebeck*), Babul (*Acacia arabica*), Alingi (*Alangium lamarcii*), and Palmyra (*Borassus flabellifer*), which are interspersed with a thick undergrowth of Cane (*Calamus rotang*). The water-birds do not inhabit the trees along the bund, but these trees both help to protect the tank and provide suitable habitat for other species of birds.

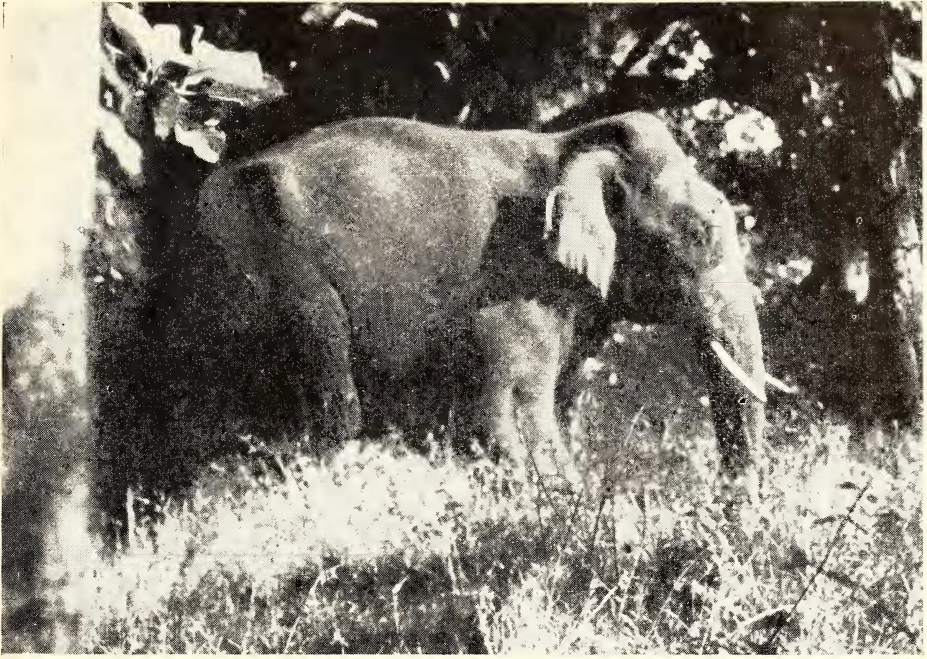
A cyclone, with winds exceeding 100 m.p.h., hit much of the eastern part of Madras State on November 3, 1966. Although the Vedanthangal bund luckily was not damaged, many of the trees along it were broken or uprooted. Much of the path was still in a mess during my visit a month later. About 70 tanks in the Maduranthakam Taluk in which Vedanthangal is located were damaged by this cyclone. As a result, many of these tanks did not contain water at the time of my visit. It was feared that the lack of water in surrounding areas would adversely affect the water-birds of Vedanthangal, as well as the 200 villages that are dependent upon these tanks for irrigation water.

The richness of the agricultural fields irrigated from the Vedanthangal Tank bear testimony to the manurial potency of the sanctuary's waters. The droppings of the birds nesting in the middle of the tank fall into the water, most of which eventually reaches the farmers' fields. The tank water contains high fertilizing properties. Even the silt, which is scraped up from the tank's bottom by the villagers during the dry season, is highly valued as a fertilizer for crops. The sanctuary's birds also help to control many agricultural pests, such as insects. Therefore, not only is the bird colony benefited by the protection afforded by the local villagers, but the villagers are benefited in return. This demonstrates that man and wild life may live together in harmony and that both may be mutually benefited.

Birds

Depending upon the onset of the north-east monsoon rains, water-birds begin to arrive at Vedanthangal in late September or early October. The birds continue to arrive up until November, during which time they are commonly observed bringing sticks and other nesting materials to the colony from surrounding areas. The arriving birds progressively colo-

Spillett : Wild Life Surveys



Above : A solitary tusker ; *Below* : A herd of elephants — Mudumalai Sanctuary.

(Photos : M. A. Badshah)

Spillett : Wild Life Surveys



Above : Juvenile Openbilled Storks in nesting colony, Vedanthangal Sanctuary ;
Below : Flamingos at Point Calimere Sanctuary.

(Photos : M. A. Badshah)

nize the available trees surrounded by water in the approximately 74-acre tank. The trunks of the trees nearest the bund, which is on the western side of the sanctuary, are the first to be submerged and hence colonized.

Nesting, hatching and the feeding of young continue from the onset of the breeding season until the young are fledged. The season usually is over by April. The birds then depart and the tank dries up. Although difficult to determine accurately, it has been estimated that at the height of the breeding season there are generally between five and six thousand water-birds in the sanctuary, including both adults and young.

No trees are colonized exclusively by a single species, although certain species predominate in particular areas. For example, the majority of the night herons appear to inhabit the southern corner of the colony, the openbilled storks (Plate IV) and grey pelicans predominate in the tops of many of the trees; egrets and spoonbills commonly are observed in the lower branches near the water. However, for the most part the colony presents a conglomeration or hodgepodge of whites, greys, and blacks. The peripheral trees on the sides of the grove inside the tank are used little for nesting, but serve as roosting trees.

According to M. Krishnan, night herons, little egrets, little cormorants and shags are the most numerous species of water-birds nesting at Vedanthangal. Openbilled storks, grey herons, spoonbills, cattle egrets, white ibises, medium egrets and pond herons follow, more or less in that order. Darters or snakebirds are present in lesser numbers and large egrets and large cormorants are relatively rare. Only two or three pairs of large cormorants normally nest at Vedanthangal. M. A. Badshah also claims that spottedbilled or grey pelicans have been observed to nest at Vedanthangal, and that fifty pairs of grey pelicans nested during the 1966-67 season.

Besides the water-birds that regularly nest in the trees at Vedanthangal, the dabchick or little grebe and the Indian moorhen also nest in the vegetation surrounding the tank. Nesting water-birds, visiting water-birds and scavenger or predatory birds which may be observed at Vedanthangal are listed in Table 3. In addition, numerous species, mainly perching or passerine birds, inhabit the trees along the bund and the vegetation surrounding the tank. A partial list of these includes: golden oriole, blackheaded oriole, blue jay or roller, pied crested cuckoo, goldenbacked woodpecker, Mahratta or yellowfronted pied woodpecker, weaver birds, Indian pitta, several species of wagtails, Indian courser, red-and yellow-wattled lapwings, hoopoe, Indian robin, king crow, bee-eaters, baybacked shrike, koel, purple sunbird, crow-pheasant, white-bellied drongo, crimsonbreasted barbet, several species of doves, partridges, and so forth.

TABLE 3
 BIRDS INHABITING THE VEDANTHANGAL WATER-BIRD SANCTUARY IN
 MADURANTHAKAM TALUK OF CHINGLEPUT DISTRICT IN MADRAS STATE

English	Tamil	Scientific	Remarks
<i>NESTING WATER-BIRDS:</i>			
Little Cormorant	Neer-Kaakkai	<i>Phalacrocorax niger</i>	abundant
Shag	„ „	<i>P. fuscicollis</i>	abundant
Large Cormorant	„ „	<i>P. carbo</i>	rare
Darter or Snakebird	Paambu-thaara	<i>Anhinga rufa</i>	frequent
Little Egret	Vellai-Kokku or Ven-Kokku	<i>Egretta garzetta</i>	abundant
Medium Egret	„ „	<i>E. intermedia</i>	common
Large Egret	„ „	<i>E. alba</i>	rare
Cattle Egret	Maatu-Kokku or Unni-Kokku	<i>Bubulcus ibis</i>	common
Pond Heron or Paddy Bird	Madayaan or Kuruttu-Kokku	<i>Ardeola grayii</i>	common
Night Heron	Vakka	<i>Nycticorax nycticorax</i>	abundant
Grey Heron	Naarayana-patchi or Narayaan	<i>Ardea cinerea</i>	common
Openbilled Stork	Naththai-koththi Naarai	<i>Anastomus oscitans</i>	common
Spoonbill	Mamptivaayan or Manvetti-vaayan	<i>Platalea leucorodia</i>	common
White Ibis	Arivaal-mookkan	<i>Threskiornis melano- cephalus</i>	common
Indian Moorhen	Kaanaankozhi	<i>Gallinula chloropus</i>	frequent
Dabchick or Little Grebe	_____	<i>Podiceps ruficollis</i>	_____
<i>VISITING WATER-BIRDS :</i>			
Spottedbilled or Grey Pelican		<i>Pelecanus philippensis</i>	frequent
Painted Stork		<i>Ibis leucocephalus</i>	rare
Plovers		<i>Charadrius spp.</i>	common
Spotted Sandpiper		<i>Tringa glareola</i>	_____
Common Sandpiper		<i>T. hypoleucos</i>	_____
Little Stint		<i>Calidris minutus</i>	frequent
Blackwinged Stilt		<i>Himantopus himantopus</i>	common
Avocet		<i>Recurvirostra avosetta</i>	rare
Stone Curlew		<i>Burhinus oedinenus</i>	rare
Curlew		<i>Numenius arquata</i>	infrequent
Purple Moorhen		<i>Porphyrio porphyrio</i>	_____
Whitebreasted Waterhen		<i>Amaurornis phoenicurus</i>	_____
Coot		<i>Fulica atra</i>	common
Common or Green winged Teal		<i>Anas crecca</i>	common
Garganey or Bluewinged Teal		<i>A. querquedula</i>	common
Pintail		<i>A. acuta</i>	frequent
Shoveller		<i>A. clypeata</i>	frequent
Grey or Spotbill		<i>A. poeclorhyncha</i>	frequent
Comb Duck or Nukta		<i>Sarkidiornis melanotos</i>	frequent
<i>SCAVENGERS OR PREDATORS :</i>			
House Crow		<i>Corvus splendens</i>	abundant
Common Pariah Kite		<i>Milvus migrans</i>	common
Brahminy Kite		<i>Haliastur indus</i>	common
White Scavenger Vulture		<i>Neophron percnopterus</i>	common
Short-toed Eagle		<i>Circaetus gallicus</i>	rare
Marsh Harrier		<i>Circus aeruginosus</i>	common
Kestrel		<i>Falco tinnunculus</i>	infrequent

Note.—Numerous species of perching or passerine birds, many of which nest at Vedanthangal, also may be observed in the vegetation and trees surrounding the Vedanthangal Tank,

VISITOR FACILITIES

The Vedanthangal Water-Bird Sanctuary is located 51 miles south of the city of Madras. The nearest airport is at Meenambakkam, near Madras, and the nearest rail head is at Karunkuzhi on the Madras-Villupuram main line, five miles east of the sanctuary. It should be noted that only passenger trains, not mail trains, stop at Karunkuzhi. However, both stop at Chingleput, which is 16 miles north of Vedanthangal. Bus services are available from both locations to the sanctuary, as well as to or from Madras. There are buses between Madras and Chingleput every half hour and regular bus service from Chingleput to the sanctuary and back every hour. On every Sunday during the season a special tourist bus runs between Madras and Vedanthangal. For those travelling by private vehicle from Madras, the turn-off from the main road at the 43rd milestone (the Grand Southern Trunk or GST Road) is well-marked by a large sign telling about the sanctuary eight miles to the east. Nearby points of interest include the archaeological finds at Mahabalipuram and the famous historic temple at Tirukalikundram.

The season for observing the nesting water-birds at Vedanthangal is dependent upon the commencement, extent and duration of the north-east monsoon rains. Generally speaking, however, the season extends from September-October through March-April, the best months being November, December and January. The sanctuary is open to visitors throughout the season free of charge. The only restrictions are that visitors may not enter the tank or molest the birds. The best time to visit the sanctuary is from 4 o'clock in the afternoon onwards. Large flights of birds return to the sanctuary shortly before sunset and the visitor on the bund then has the sun behind his back, which gives him a clear view of the sanctuary's activities. There is also a peak of activity in the early morning, but the sun is then opposite the observer on the bund.

The Collector of Chingleput officially recognized Vedanthangal as a sanctuary and sanctioned the first government funds towards its maintenance in 1936. Although the Government has managed and protected the sanctuary since that time, it was not until 1960 that steps were taken to develop this area for the enjoyment of the general public. Since then a tar road leading to the sanctuary has been built and a parking lot provided below the bund. Vehicles, including large buses, are accommodated easily in the parking lot. Recently public rest rooms, an observation platform and an observation tower have been constructed along the bund on the western side of the sanctuary. Visitors may observe the activities of the sanctuary's birds from either the observation platform or tower, as well as from the tree-lined path on top of the bund.

The U.S. Consul-General in Madras used his good offices in procuring a telescope from the American Museum of Natural History, New York, through the courtesy of Mr. and Mrs. Dyer, which has been permanently mounted in the tower for the use of visitors.

A Forest Rest House also was recently constructed approximately one-half a mile from the sanctuary. The Forest Department provided both the funds and the plans for this Rs. 1,11,000 building, which was built by the Public Works Department. This rest house will provide four first class double suites and a canteen for visitors and was scheduled to be opened during the early part of 1967. The procedure for securing reservations for these suites had not been decided upon at the time of my visit. In addition, there is a Public Works Department Rest House at Karunkuzhi, seven miles from the sanctuary. No catering arrangements are provided, but reservations for this bungalow may be obtained through the District Collector at Chingleput.

A Forester and a Watchman are stationed at Vedanthangal by the Forest Department to assist visitors and to protect the sanctuary. The Vedanthangal Tank also provides water for irrigation to the nearby agricultural lands. This water passes through two sluices along the bund and two Government Watchers are charged with their supervision. It is imperative that sufficient water remains in the tank during the nesting season to protect the water-birds and their young. A recent notification issued by the Government of Madras also prohibits the shooting of water-birds within a radius of 20 miles of the sanctuary from August 1 through May 31 each year.

I was amazed by the number of visitors, particularly bus-loads of students, during my visit to Vedanthangal on Sunday, December 4, 1966. As to be expected, most visitors come to the sanctuary on week-ends. Nevertheless, the Forester stationed at Vedanthangal informed me that there were over 5000 visitors the previous day, which was Saturday, and prior to our departure that night he claimed that over 10,000 visitors were tallied that day! This clearly demonstrates that the general public is interested in wild life—if the basic facilities are provided first so that wild life may be observed and enjoyed in relative comfort and at nominal cost. It also provides a unique opportunity to educate the public to the values of wild life and the dire need for wild life conservation in India.

It is true that many of those visiting the sanctuary do not fully appreciate what they see or are able to identify correctly more than a few of the species of birds observed. But their presence indicates a genuine interest in wild life and it behoves the Forest Department and more specifically the Wild Life Organization to provide for their education in wild life conservation. Therefore, the following general suggestions are presented: (1) An illustrated board depicting the species of

water-birds commonly observed at Vedanthangal should be erected near the bund. This would help visitors at least to identify many of the birds which they see. (2) Booklets, pamphlets, and other information concerning Vedanthangal, as well as other wild life sanctuaries in Madras and in India, should be made available at minimal cost to visitors. The booklet, *THE VEDANTHANGAL SANCTUARY FOR WATER-BIRDS* by M. Krishnan, which was published by the Madras State Forest Department in 1960, and *THE BOOK OF INDIAN BIRDS* by Sâlim Ali, published by the Bombay Natural History Society, are worthy of special note. General information concerning Vedanthangal and other sanctuaries also should be distributed through the Tourist Department. Efforts should be made to conduct regularly scheduled tours of such areas under the direction of well-qualified guides. Commercialism, however, should be avoided in wild life areas. (3) Forest Department personnel stationed in wild life sanctuaries should be very carefully chosen, as well as given instruction in the basic principles of wild life conservation. For example, the Forester and Watcher stationed at Vedanthangal should not only have a genuine interest in wild life, but should be able to identify the sanctuary's plants and animals, describe their life histories and importance, and know the history of the area. In short, they should be able to present or conduct meaningful lectures or tours of the sanctuary and to answer correctly visitor's questions. (4) Finally, accurate observations concerning the sanctuary and its wild life should be continuously recorded. Changes in population densities of different species, numbers of visitors to the sanctuary and so forth should be kept on record and made available to the public. Scientific investigations of wild life by qualified personnel also should be encouraged.

III. THE GUINDY DEER PARK

INTRODUCTION

Among the larger cities of India and perhaps of the world, Madras is unique in having an extensive natural park within its limits. This is the Guindy Deer Park, which includes the Children's Corner. The area comprising Guindy was the private property of Gilbert Ricketts during the early part of the 19th century. This property and his private residence (Guindy Lodge), which is the present Raj Bhavan, were purchased by the Madras Government after his death in 1817. The residence served as a week-end resort and a country residence for the Governor of Madras from 1825 until 1947. It then became the permanent residence for the Governor.

The late A. J. John, then Governor of Madras, offered to relinquish the bulk of the 1262-acre estate. While approving of this offer, the

Prime Minister of India, the late Jawaharlal Nehru, expressed the hope that the Government of Madras would preserve the park, improve it and arrange for its use as a public park with a portion marked out as a Children's Corner. The governor retained 300 acres as a part of the Raj Bhavan. Also, 407 acres were set aside for an Institute of Higher Technology, which has since been established under the supervision of the West German Government. The remaining 555 acres were set apart as a Deer Park and came under the jurisdiction of the Forest Department in March 1958.

Of the 555 acres supposedly devoted to the Deer Park, 76 acres are occupied by the Kattankollai and Applankulam tanks, 14 acres by the Children's Corner and 10 acres by a riding school built by the Riding Club of Madras. Five riding trails utilized by riding clubs occupy between 30 and 40 acres. The Park's nine miles of roads occupy approximately another 40 acres. And, 20 acres have been allotted for the establishment of a Research and Demonstration Centre for the State Silviculture Division.

Only 395 of the Park's present 555 acres in actuality are devoted to a true Deer Park as proposed in the Government Order Ms. No. 3911, Food and Agriculture, dt. 29.11.58 and approved by Government Order Ms. No. 387, Food and Agriculture, dt. 2.2.59. Additional proposals, such as for the construction of a golf course inside Guindy Park, also have been presented and are now pending.

Guindy Park has not only been desecrated and diverted from the objectives for which it was originally intended and sanctioned by the Government, but ever increasing pressures are being exerted upon the Guindy Deer Park.

Children's Corner

Fourteen acres in the north-eastern corner of the Guindy Deer Park, adjoining the Gandhi Memorial, have been set apart and constituted as a Children's Corner. Work was begun in January 1959 and the Children's Corner was inaugurated on April 14 of the same year by the late Jawaharlal Nehru. The Children's Corner has a two-fold objective : (1) It should serve as a recreational park and garden, and (2) it should help young people to develop an abiding interest in wild life and nature study. In the words of Jawaharlal Nehru, the aim of the Children's Corner is to help children and young folk to learn 'about this beautiful world of ours, about flowers and trees and birds and animals and . . . How easy it is to make friends with them and with everything in Nature, if you go to them affectionately and with friendship'.

In keeping with the objectives for the Children's Corner, the trees and shrubs in this area have been labelled with their common and scientific names. A platform has been constructed around the base of a large

banyan tree to serve as an open air theatre for programmes, particularly for presentations during the annual Wild Life Week. A nature library for children with books on animals, birds, insects, and so forth has been established in the park. Although most of these books are in English, it is hoped that volumes in the children's native tongue will soon be made available. Four aviaries for birds and 13 enclosures for animals have been constructed. A special effort has been made to keep species of birds and animals which children may handle and with which they may become intimately acquainted. Free pony rides are given to children on Saturday and Sunday evenings and elephant rides were inaugurated in June of 1966. Ten camp sites also afford camping facilities for school children and college students. Additional recreational facilities in the Children's Corner include : a midget train that runs on Saturday and Sunday evenings, a playground with a merry-go-round, swings, bars, see-saws, sand piles and so forth.

It is sincerely hoped that in the development of the Children's Corner the primary objectives in the establishment of this park will always be borne in mind. India has perhaps a greater wealth in floral and faunal species than any other nation in the world. A special effort should be exerted to help the young people of this great nation to become acquainted with, to appreciate, and above all to understand the value of their wild life heritage. There is no need to introduce exotic plants or animals from other countries into the Children's Corner or Guindy Park. African lions and zebras, South American llamas and monkeys, and North American pumas and raccoons may be seen in almost any zoo in the world. But many of the once abundant plants and animals in India regretfully are becoming increasingly rare. Further, the endemic flora and fauna of this region would not only present a varied and spectacular display, but also something unique and worthy of note throughout the world.

An indication of the popularity of the Guindy Deer Park and the Children's Corner is presented by the number of visitors tallied by the gatekeepers during the months prior to my visit. In July 1966 there was a total of 28,330 visitors, 35,500 in August, 24,000 in September and 31,920 in October. This is a grand total of almost 1,20,000 during this four-month period. Members of the State Wild Life Organization stationed at Guindy include a Ranger, two Foresters, a Forest Guard and eight Watchers.

Flora and Fauna

The Guindy Deer Park represents a thorny scrub jungle, typical for much of the southern arid zone of India. Although modified to some extent, the endemic flora of the Park has been remarkably well preserved

for over a century and a half and represents one of the most natural areas to be found in this part of Madras State.

There are more than 30 naturally occurring species of trees represented in Guindy Park. Exotic tree and shrub plantings, however, have taken place inside the Park during recent years. A 47-acre plot was recently ploughed and planted with grass to provide fodder for deer. Although it has been the intention in most cases to augment the food supply of the native animals and to attract greater numbers of birds to the Park, I am of the opinion that both the flora and fauna of the Guindy Deer Park should be maintained in as natural a state as possible. Guindy is supposedly a Park, not a farm nor an orchard. Therefore, in so far as possible, it should be maintained in its natural state.

Originally the Park area was a waterless tract, but two bore wells and a number of tanks have been recently constructed. Water troughs and salt licks have been scattered throughout the Park to provide for the animals within its confines. These encourage the animals to remain inside the Park. Particularly during the dry season, animals are prone to wander outside where they are extremely vulnerable.

One of the reasons for Guindy's modification is the ever increasing demand upon the Park for uses other than those for which it was intended. For example, over 1500 people, mostly workers at the Raj Bhavan, live within the Guindy Park. Members of the Raj Bhavan staff are allowed to graze 52 head of cattle within the Park. They are likewise permitted to collect dry fuel from the Park two days each week. The Riding Club of Madras and the Madras Polo and Riders Club are permitted to use the Park for riding horseback, over 100 horses are allowed on Guindy's roads and paths and a riding school was built recently inside the Park. All of these activities modify both the floral and faunal composition of the Guindy Deer Park, as well as distract from its aesthetic values. You cannot have your cake and eat it too. It must be decided once and for all—Is Guindy going to be maintained as a TRUE Park, as was originally proposed and approved by Government orders? Or, is Guindy gradually going to be diverted from its original objectives and eventually become just another exploited area and a park only in name?

The Guindy Deer Park presently contains perhaps the largest herd of blackbuck existing in the Indian Union. According to the July 1966 census, it was estimated that there are over 700 head of blackbuck in the Park. This typically Indian animal is found in no other country in the world and India was once renowned for the large herds of this beautiful beast that roamed its plains from the Punjab in the north to Cape Comorin in the south. Regretfully, however, these herds have been decimated and in areas where herds of over a hundred were common less than a decade ago, it is now a rarity to see even a single animal.

In addition to blackbuck, it is estimated that there are approximately 1400 head of chital or spotted deer in the Guindy Deer Park. These beautiful animals likewise are a typically Indian species. Less conspicuous mammalian species include bonnet macaques, civet cats, common mongoose, hares and various rodents. The bird life is both numerous and varied. Peafowl and black partridge also have been introduced recently into the Park.

Large predators have been excluded from the Guindy Deer Park. Although dogs, which prey upon blackbuck and chital, occasionally breach the approximately 8-foot-high fence surrounding the Park, there are no natural checks to balance the numbers of ungulates in the Park with their available food supply. As a result, numbers of blackbuck and chital have increased until the entire Park has been severely overgrazed. The presence of domestic livestock and other disturbances also have contributed to the lowering of the area's carrying capacity. It is imperative that measures soon be taken to reduce and to maintain the Park's ungulate populations at a level compatible with the natural supply of forage. This should be undertaken by the State Wild Life Organization and done in a scientific manner. Periodically numbers of animals should be determined accurately, as well as the carrying capacity of the area, and excess animals then systematically removed.

Twelve head of white blackbuck were introduced into the Guindy Park in 1956. Only ten of these animals remain, however, I observed a number of crosses between these and the naturally occurring blackbuck in Guindy. Such animals are a curiosity and should be displayed in a zoological garden, not in a natural park such as Guindy. An effort should be made to remove these animals so that only native stock will remain inside the Park.

The Guindy Deer Park is confronted with a number of major problems, which must be overcome. Nevertheless, it is both a unique and impressive area worthy of repute. The fact that this Park is located within the confines of one of India's largest cities, readily accessible to literally millions of people, makes it even more noteworthy and imperative that it be preserved for future generations. A noted journalist and fellow countryman, Mr. Bill Ballantine, recorded in the Visitor's Book that the Guindy Deer Park is 'Without doubt one of the most pleasant animal parks of India, if not in the world'. May it so remain !

IV. OTHER WILD LIFE SANCTUARIES IN MADRAS STATE

THE POINT CALIMERE WILD LIFE SANCTUARY

It has been proposed that 4272 acres (6.7 sq. miles) in the Kodiakadu Reserved Forest in the Thanjavur District be constituted as the Point Calimere Wild Life Sanctuary. The major attraction of this area is the large concentrations of flamingos and other migratory water-birds, which gather here primarily during the winter months. With the exception of the Great Rann of Kutch, nowhere in Asia may such large numbers of flamingos be seen.

Roughly half of the proposed sanctuary would consist of tidal swamps, ideal habitat for flamingos (Plate IV) and other water-birds. This part of the proposed sanctuary is located in what is known as the Great Swamp. Until 1963 the Great Swamp included over 73,000 acres of relatively virgin swamplands. However, 34,000 acres were then set apart for the extraction of salt and the manufacture of subsidiary products. In order to protect this area and preserve the thousands of birds that inhabit it, it is imperative that action be taken as soon as possible to establish and maintain the remaining part of the Great Swamp as an inviolate wild life sanctuary.

The rich and varied bird life in the proposed sanctuary includes such species as : flamingo, whistling teal, shoveller, pintail, tufted pochard, redcrested pochard, curlews, greenshank, redshank, ruff, golden and grey plovers, godwit, blackwinged stilt, whimbrel, oyster-catcher, avocet, brownheaded and blackheaded gulls, terns, and so forth.

The best season to see migrant birds at Point Calimere is between November and March. Reliable sources claim that it is not uncommon to see more than 10,000 flamingos during this season, although only about 1000 reside here throughout the year. It is further estimated that as many as 50,000 water fowl (ducks and geese) winter here, as well as 25-30,000 shore birds, such as plovers, stilts, and so forth. There are, of course, also a good number of resident bird species, which may be seen throughout the year.

The other half of the proposed sanctuary would consist of a dense dry-evergreen forest, which formerly was known as the Kodiakkarai Deer Sanctuary. This is the only forest area in the District and, although severely overgrazed by domestic livestock, the exploitation of other forest produce has been halted since 1962. Vegetation consists mainly of the following species : *Mimusops hexandra*, *M. littoralis*, *M. elangi*, *Memecylon edule*, *Salvadora persica*, *Maba buxifolia* and so forth.

It is estimated by the Forest Department that the proposed sanctuary presently contains over 1000 head each of blackbuck, chital or

spotted deer, and wild boar¹. Other mammals include jackal, civet cats, mongoose, various rodents, etc. There are, however, no large predators.

Point Calimere is accessible by both train and bus. The nearest airport is at Tiruchirappalli, approximately 105 miles west of the sanctuary. There is also an airstrip that may be used by private or chartered plane at Thanjavur, 70 miles from the sanctuary. The Point Calimere railway station is near a Forest Rest House. The Great Swamp is to the west of the station and the Kodiakkarai Forest to the east. The rest house provides two double suites and reservations may be obtained from the State Wild Life Officer, c/o Chief Conservator of Forests, Central Office Buildings, 81 Mount Road, Madras-6. Point Calimere has been constituted as a Wild Life Sanctuary in Govt. Order MS No. 1821 Agriculture, dated 13-6-1967. The State Wild Life Organization has stationed a Range Officer, two Foresters and a Forest Guard here and the sanctuary has had approximately 1000 visitors per year for the past three seasons.

TOP SLIP WILD LIFE SANCTUARY

A 27,457-acre (42.9 sq. ml.) area consisting of Top Slip, Grass Hills and Attakatty in the South Division of the Coimbatore District, adjacent to the Kerala border, has been approved by the Government of Madras for a wild life sanctuary. Development of the sanctuary is pending upon the completion of the Parambikulum Aliyar hydroelectric project, which includes the blasting of rock tunnels in this area. A wild life sanctuary already has been constituted in the adjoining portion of Kerala State.

The nearest railway station is at Pollachi, about 30 miles north of the sanctuary. The nearest airport is an additional 30 miles north of Pollachi at Coimbatore. Two rest houses, one belonging to the Forest Department and the other to the Public Works Department, are located in the sanctuary. Both have two double suites and provide full facilities. Reservations may be obtained from the District Forest Officer, Coimbatore South Division, Pollachi, Coimbatore District.

The forests in this area vary from deciduous to semi-evergreen to evergreen, depending primarily upon elevation. Evergreen forests are confined primarily to the upper reaches of the Punachi Range, although there are a few compact isolated patches in the Palakadavu, Ulandi and Mount Stuart blocks of the Tunakadavu Range. Semi-evergreen forests adjoin the evergreen portions and deciduous forests predominate on the lower

¹ See also 'The Point Calimere Sanctuary, Madras State—May 1967'. *J. Bombay nat. Hist. Soc.* 64 : 512-523 (1968)—Eds.